Pre Algebra Core Curriculum Map

	Standard	Content Objective	Process Standard/Objective	Suggested materials/strategies
September	Number and Operation	**1.2.1, 1.2.2** - Recognize and create equivalent forms of a rational number, and find their approximate locations on a number line **1.2.3** - Find a rational number between two rational numbers **1.3.1** - Compare and order rational numbers **1.4** - Solve a variety of real life problems using rational numbers a) **1.4.3, .1.3.2 -** Identify the patterns and effects of arithmetic operations among fractions, decimals, and percents including those <1% and >100%. b) **1.1.1 -** Compute using selected methods from among mental arithmetic, estimation, paper and pencil, and calculator c) **1.1.4 -** Justify the steps used in solving problems using correct notation d) **1.1.3 -** Check the reasonableness of results using estimation. e) **1.2.4 -** Choose appropriate and convenient forms of rational numbers for solving problems and representing solutions f) **2.3.5 -** Identify information as relevant or extraneous to a problem **1.1.2** - Review and apply arithmetic operations among integers. **1.1.2 -** Review and apply exponential notation. **1.2.5** - Recognize inverse relations of squares and square roots **1.3.5 -**Represent very large and small numbers using scientific notation **1.4.4** - Solve problems using simple proportions including unit rates	**Problem solving**: look for patterns, draw picture or diagram, choose appropriate operation, make a model, select and use appropriate methods for computing **Reasoning/Proof**: reflect on thinking process in solving problems, explain and justify answer, examine patterns, make conjectures **Communication**: express ideas clearly to peers and teacher, class and group discussion, use precise language of mathematics **Connections**: use real-world situations and physical models, establish connections between mathematical, physical and real-world representations, connect to other curricular areas such as literature **Representation**: include appropriate symbolic representation, find applications in real life, represent problems numerically, formulate conjectures related to mathematical concepts	number line, games, graph paper, coop structures calculators, cards, dice Box Cars and One Eyed Jacks, What's My Number, card sums and products, newspaper ads, graph paper, M&M activity, pattern blocks, fraction strips Geoboards, Bulls Eye estimation game AlgeBlocks, number line, cards, counter chips, calculators., centimeter cubes, Space Invaders, graphing calculators., Fermi problems, graphing calculators. Color Tiles or centimeter cubes, graph paper, maps, Pattern Blocks

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October	Measurement Geometry Measurement Measurement	**4.1.1** - Estimate measurable quantities in both standard and metric units e.g. A vase holds a little less than a liter of water **4.1.2** - Convert from one unit of measure to an equivalent unit of measure within the same system, using a given conversion factor. (e.g. 60miles/hour times 1 hour/3600 sec times, 5280ft/1 mile = 88ft/sec) **3.2.1** - Create and interpret scale drawings **4.2.1** - Using map scales, determine approximate distances between two points **4.2.2** - Solve problems involving scale factors using ratios and proportions **4.1.3** - Measure angles, perimeter, area, and volume using correct size and types of units **4.2.6** - Develop formulas using hands on experiences and sketches for calculating circumference of circles and area of triangles, parallelograms, and trapezoids. -Use formulas to calculate circumference of circles, areas of triangles, parallelograms, and trapezoids	**Problem Solving**: check reasonableness of result, use proportional reasoning, draw pictures or diagrams, make a model or simulation, look for patterns, estimate solutions by relating reasonableness **Reasoning/Proof**: propose and critique alternative approaches, consider the thinking of others, make and investigate conjectures, ask questions such as: "Why do you think so?" "What leads you to that conclusion?" **Communication**: use precise mathematical language, organize and consolidate information through oral presentation **Connections**: apply mathematical ideas and relationships outside the classroom, e.g. science, other curricular areas, and everyday life **Representation**: use a variety of visual representations to explore and formulate conjectures such as maps, nets, technology, use correct symbolic notation	tape measure, containers, weights, linking cubes, metric chart calculators Pattern Blocks, graph paper, dot paper, maps, rulers, color tiles, centimeter cubes protractor, centimeter cubes, geoboards, capacity containers, string, graph paper circular objects, Geoboards, Pattern Blocks, measuring tools graphing calculators
November	Measurement Geometry Measurement Algebra Geometry	**3.1.3** - Classify two and three dimensional objects according to their defining characteristics **4.2.5** - Calculate surface area and volume of right prisms and cylinders using appropriate units **3.1.1, 3.1.2** - Identify congruent and similar two dimensional shapes by recognizing proportional relationships among angles, side lengths, perimeters using hands on activities and sketches **4.2.4** - Use similar triangles to find inaccessible heights and distances **3.1.2** - Find missing lengths of similar plane figures using proportions **3.1.4** - Find a pattern in the relationship between the areas of similar two-dimensional objects **3.1.4** - Find patterns and identify proportional relationships among the volumes of similar three-dimensional objects	**Problem solving**: use counter examples, eliminate possibilities, make a model or simulation, draw a picture, find a pattern, consider thinking strategies of others **Reasoning/Proof**: link problem solving to sequence of steps and draw reasonable conclusions, examine pattern noting regularities and irregularities, formulate counter examples **Communication**: use group and class discussions and oral presentations, express ideas coherently to teacher and peers **Connections**: formulate real-world situations that require extended investigation and solve these, apply math ideas to situations outside classroom in other curricular areas and real life **Representation**: use a variety of visual representations, use physical model to represent problems	calculators, Geosolids, right prisms, cylinders measuring tape, Pattern Blocks, graph paper, sketch and trace, protractors pictures and sketches, tape measure, ruler pictures and objects, measuring tools Geosolids, pictures, Pattern Blocks, GeoBoards, origami Geosolids, calculators, pictures

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December	Data Analysis	**5.1.1** - Conduct a variety of surveys and experiments to collect data a) **5.1.2 -** Organize and display data using graphical representations including line plots, bar graphs, stem and leaf plots, histograms, scatter plots, circle graphs, box and whisker plots, and pictographs b) **5.1.3, 5.1.9, 5.1.8 -** Make conjectures and predictions from graphical representations, evaluate reported inferences, and describe limitations of predictions when using data samples c) **5.1.4 -** Calculate the mean, median, mode and range for a data set d) **5.1.5 -** Choose a measure of central tendency most appropriate to analyze a particular set of data **5.1.6** - Describe how an individual data point may affect a central tendency	**Problem solving**: make a simulation or model, solve a simpler problem, propose and critique alternative approaches, select and use appropriate methods of computation, use questions such as, "How are these ideas related?", "Did anyone think of a different way?" to clarify and understand concepts **Reasoning/Proof** : identify information as valid or invalid, and as sufficient or insufficient, make and investigate conjectures, **Communication**: express and present ideas to peers and teachers using appropriate mathematical language, organize thinking through oral and written presentations **Connections**: formulate real-world situations that require extended investigation and problem solving, find application of math concepts in newspapers, magazines, and real life **Representation**: use a variety of visual representations, e.g. technology, graph paper, models	manipulatives, Grab a Handful, graphing calculators, graph paper, experiments surveys, Random Remainders activities books such as Super Source, Creative Graphing, Data Analysis (see Creative Publications) Manipulative activities, data tables, graphs, USA Today Snapshots, see above see above
January	Probability	**5.2.1** - Conduct experiments to approximate the probability of simple events **5.2.2** - Compare individual small group and large group sample spaces of an experiment in order to explore the law of large numbers **5.2.3** - Derive the theoretical probability of an event mathematically (reflect on actual experiments) **5.2.4** - Represent the probability of an event as a fraction, percent, ratio, and decimal **5.2.6** - Recognize that the sum of the probability of an event and the probability of it's complement is equal to one **5.2.6** - Identify mutually exclusive events **5.2.7 -** -Decide if a game or process is fair	**Problem solving**: make a list/table, make a simulation, check for reasonableness of result, evaluate math thinking processes, proportional reasoning **Reasoning/Proof**: identify information as necessary and conclusions as valid or invalid, make conjectures, recognize that a pattern or a conjecture do not constitute proof **Communication**: employ precise language and correct notation, consolidate thinking in journals, portfolios, group discussion **Connections**: find applications of mathematical concepts in newspapers, magazines, radio, TV, real life, establish connections among math expressions and real life situations, apply concepts outside classroom **Representation**: represent concepts using physical models, visualizations and appropriate symbolic notation	Probability simulations of graphing calcs, Roll Em, To the Top, Box Cars and One Eyed Jacks, cards, dice, coins, spinners Blue vs. Red, Same vs. Different, Odd and even products race (BER)

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February	Algebra Number and Operation Algebra	**2.1.3** - Create and extend simple numeric and visual patterns including those that have a recursive nature e.g. Fibonacci numbers, triangular numbers and square numbers **2.1.2** - Describe simple patterns using mathematical rules and algebraic expressions **2.1.1** - Write variable expressions to model real-world situations from graphs, tables, manipulatives and pictures **2.2.1** - Evaluate algebraic expressions given values for the variable(s) using order of operations **1.3.4** - Recognize the use of special multiplication properties of 1 on numerical and variable expressions **1.3.4** - Recognize that division by zero is not defined **1.3.6** - Use Commutative and Associative Properties to add and multiply numbers and variable expressions **1.3.6** - Simplify algebraic expressions including application of distributive property	**Problem solving**: look for a pattern, identify counter examples, solve a variety of non routine problems, choose an appropriate operation, make a model, extend math knowledge by considering the thinking of others **Reasoning/Proof** : formulate counter examples, realize that observing a pattern and making conjectures is proof, link problem solving to the sequence steps and draw reasonable conclusions **Communication**: group discussion, use precise notation and mathematical language, express ideas clearly **Connections**: establish connections among mathematical expressions and real-world situations, explore historical and multicultural contributions **Representation**: represent problem situations numerically and algebraically, use technology to represent problems, use appropriate notation and mathematical language	Pattern Blocks, paper folding, sequences, tessellations, Color Tiles, centimeter cube Coop Structures, calculators Algeblocks, Pattern Blocks, centimeter cubes, graphs, tables, pictures graphing calculators, Linker Cubes Algeblocks, Linker Cubes or centimeter cubes (area model for multiplication) Algeblocks
March	Number and Operation. Algebra Number and operation Algebra	**1.4.1** - Recognize the absolute value of a number as the value of its distance from zero **1.4.2** - Evaluate numeric and algebraic expressions containing absolute value **1.3.5** - Recognize and use the inverse relationships of addition and subtraction, multiplication and division **2.2.4** - Solve one-step and two-step, single variable equations and inequalities including equations with rational numbers **2.3.4** - Use simple, one variable equations and inequalities to model real world situations from tables, graphs and manipulatives	**Problem solving**: guess and check, eliminate possibilities, work backwards, propose and value alternative approaches, make a model or simulation **Reasoning/Proof**: link problem solving to the sequence of steps and draw reasonable conclusions, examine patterns, explain and justify problem solving procedures **Communication**: express math ideas clearly and coherently using appropriate mathematical language **Connections**: establish connections between mathematical expressions and models or real life situations, apply to areas outside classroom, connect to science or other curricular areas **Representation**: represent concept using physical models, visualization, represent problem situation algebraically	AlgeBlocks, Student Formations, number line graphing calculator Hands on Equations, centimeter cubes Hands on Equations, Pattern Blocks Hands on Equations, tables, graphs, manipulatives, graphing calculators, Pattern Blocks

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April	Algebra Geometry Algebra	**2.3.2** - Graph ordered pairs of rational numbers on a rectangular coordinate system **2.3.3** - Identify approximate rational coordinates given a graph of a point on a rectangular system **3.3.1** - Reflect a geometric shape across a line in a coordinate plane and identify coordinates of the vertices **3.3.2** - Translate a geometric shape a given distance on a coordinate plane and identify coordinates of the vertices **3.2.2, 2.3.4** - Model real world linear patterns and relationships using tables, graphs, manipulatives, verbal rules, and algebraic rules **2.3.1** - Create tables, graphs, and algebraic expressions to represent relationships between two variables	**Problem solving**: make a list, table graph or equation, draw a picture or diagram, make a model, propose or critique alternative approaches, develop understanding and clarification through questions such as, "What makes you think so?", "How does this work relate to past concepts?" **Reasoning/Proof**: examine patterns noting regularities and irregularities, link problems to sequence of steps, draw reasonable conclusions **Communication**: employ precise language and notation to clearly express ideas, organize and consolidate thinking using communication methods such as journals, portfolios, group discussion, presentations and writing **Connections**: establish connections among math expressions , physical models, and real-world situtations **Representation**: Use a variety of representations to explore conjectures related to math concepts and represent problems situations verbally, numerically, graphically, and algebraically	graph paper, graphing calculators, Student Formations Battle Ship, Coop Structures Student Formations, Pattern Blocks Student Formations, Pattern Blocks real life data, Pattern Blocks , color tiles, centimeter cubes, maps, CBRs, graphing calculators, Geometer's Sketch Pad, little cars, walking demonstrations
May	Algebra	**2.1.1** - Using tables, graphs, and manipulatives, recognize slope as a rate of change **2.2.3** - Determine the slope of a linear relation from a graph or ordered pairs **2.2.2** - Identify the horizontal and vertical intercepts of a linear relation from a graph or table -Review for CRT	**Problem solving**: look for patterns, guess and check, make a list, table, graph or equation, solve a simpler related problem, make a model or simulation, proportional reasoning **Reasoning/Proof**: realize that observing a pattern and stating a conjecture is not necessarily proof, draw reasonable conclusions, examine patterns **Communications**: express ideas coherantly and clearly using precise language and notation, group discussion, oral or written presentation **Connections**: formulate real-world situations that require extended investigation, explore historical contributions (Descartes discovering cartesian plane and slope), find real-world applications	CBRs, tables, graphs, data gathered from activities, graphing calculators CBRs, graphing calculators graphing calculators, graphs, graph paper, tables interactive games